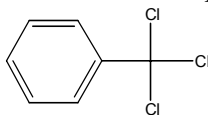


BENZOTRICHLORIDE

CAS No. 98-07-7

First Listed in the *Fourth Annual Report on Carcinogens*



CARCINOGENICITY

Benzotrichloride is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC V.29, 1982; IARC S.4, 1982; IARC S.7, 1987). When administered by gavage, benzotrichloride induced squamous cell carcinomas of the forestomach and adenocarcinomas of the lung in female mice. Benzotrichloride was tested in three studies by skin application to female mice. It induced squamous cell carcinomas of the skin and lung adenomas in all three experiments and upper digestive tract tumors (carcinomas of the lips, tongue, esophagus, or stomach) and lymphomas were observed in two of the three experiments. In a mouse-lung tumor bioassay, benzotrichloride increased the incidence of lung adenomas.

There are no data available to evaluate the carcinogenicity of α -chlorinated toluenes, including benzotrichloride, in humans (IARC V.29, 1982; IARC S.4, 1982; IARC S.7, 1987). There is evidence that employment in the production of chlorinated toluenes, which involves potential exposure to benzotrichloride as well as other chemicals, increases the risk of respiratory cancer.

PROPERTIES

Benzotrichloride is a clear, colorless-to-yellowish, oily liquid with a penetrating odor. It is insoluble in water and soluble in benzene, diethyl ether, and ethanol. Benzotrichloride is unstable and hydrolyzes to benzoic acid and hydrochloric acid in the presence of moisture. It is available in the United States as a liquid containing 99% active ingredient.

USE

Benzotrichloride is used extensively as a chemical intermediate. Its most important derivatives are benzoyl chloride and substituted benzophenones used to stabilize plastics in the presence of ultraviolet light (SRIa, 1986). It is also used as a dye intermediate in the preparation of eight dyes and pigments, including five produced in commercial quantities in the United States. Additionally, benzotrichloride is used to make benzotrifluoride, hydroxybenzophenone, antiseptics, and antimicrobial agents (IARC V.29, 1982).

PRODUCTION

The 1997 *Directory of Chemical Producers* lists one producer of benzotrichloride (SR1a, 1997). The 1998 *Chemical Buyers Directory* names one domestic supplier of the compound and *Chemycyclopedia* 98 names two U.S. suppliers (Tilton, 1997; Rodnan, 1997). From 1982 to 1990 and in 1992, the USITC identified two companies producing an unspecified amount of benzotrichloride (USITC, 1983-1991, 1994). For the remaining years of the 1990s only one manufacturer was reported (USITC, 1993, 1995). The latest production volume found was for 1982 when 35 million lb of the chemical were produced (HSDB, 1997).

In 1986, U.S. imports of benzotrichloride totaled 363,000 lb (HSDB, 1997). In 1983, imports through the principal customs districts totaled 39,600 lb (USITCa, 1984). The 1979 TSCA Inventory reported three companies with a total production of 30 million lb in 1977 (TSCA, 1979). It was estimated that approximately 40 million lb of benzotrichloride are needed annually for the U.S. production of benzoyl chloride alone. Benzotrichloride has been produced commercially in the United States since at least 1919 (IARC V.29, 1982).

EXPOSURE

The primary routes of potential human exposure to benzotrichloride are inhalation, ingestion, and dermal contact. Its exclusive use as a chemical intermediate results in minimal potential consumer exposure. Exposure to the chemical from industrial fugitive emissions is also expected to be very low due to its ability to hydrolyze rapidly in the presence of moisture. Consumer exposure to small amounts may occur during the use of pharmaceuticals made with benzotrichloride. Potential occupational exposure of workers could be significant due to releases in the work environment in the liquid or vapor form. A realistic exposure assessment is not possible because the number of workers, exposure levels, and releases to the environment are not documented (CHIP, 1982a). The National Occupational Exposure Survey (1981-1983) estimated that 171 workers potentially were exposed to benzotrichloride (NIOSH, 1984). Potential occupational exposure can occur during the production, formulation, packaging, and application of antiseptics made with benzotrichloride or benzoyl chloride. Benzotrichloride has been identified in surface waters at unreported concentrations. It does not occur naturally (IARC V.29, 1982). The Toxic Chemical Release Inventory (EPA) estimated that 8,007 lb of benzotrichloride were released to the environment from five facilities that produced, processed, or used the chemical in the United States in 1996. Of that total, 99.8% was released to the air and the remaining 0.2% to water (TRI96, 1998).

REGULATIONS

Benzotrichloride is regulated by EPA under the Clean Air Act (CAA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Superfund Amendments and Reauthorization Act (SARA), and Toxic Substances Control Act (TSCA). Benzotrichloride is subject to reporting rules under CERCLA, RCRA, SARA, and TSCA. Benzotrichloride is designated as a hazardous constituent of waste under RCRA, and a reportable quantity (RQ) of 10 lb has been established under CERCLA. It is listed as an extremely hazardous substance under SARA for which emergency response plans must be prepared if the threshold planning quantity of 100 lb is reached. OSHA regulates benzotrichloride under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-12.